MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2022/2023

BKC2024 – DATABASE MANAGEMENT SYSTEMS

(All Sections/Groups)

24 NOVEMBER 2022
9.00 a.m - 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of 4 pages with 4 questions only.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

QUESTION 1

(a) Explain **FOUR (4)** advantages of Database Management Systems (DBMS) with an example each. (8 marks)

(b) Consider the following scenario:

A PRODUCT table consists of an attribute called AMOUNT. Assume that there is a product with the current AMOUNT value of 40. Also assume that there are two concurrent transactions, T1: Purchase 100 units and T2: Sell 30 units.

TIME	TRANSACTION	STEP	STORED VALUE
1	T1	Read AMOUNT	40
2	T1	AMOUNT =40+100	
3	T1	Write AMOUNT	140
4	T2	Read AMOUNT	140
5	T2	AMOUNT =140-30	
6	T1	****ROLLBACK****	40
7	T2	Write AMOUNT	110

Note:
Computation for:
T1: Amount = Amount + 100
T2: Amount = Amount - 30

i) Briefly describe concurrency control. (2 marks)

ii) What type of problem is happening in the above scenario? Explain the situation that led to this problem. (3 marks)

iii) Explain **TWO (2)** types of concurrency control to prevent the above problem. (6 marks)

(c) As the number of database applications grew, data management became an increasingly complex job, thus leading to the development of database administration function which is managed by a database administrator (DBA). List **SIX (6)** managerial roles of a DBA. (6 marks)

(Total: 25 marks)

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QUESTION 2

(a) i) Describe the **FOUR (4)** data abstraction levels with the aid of a diagram. (10 marks)

ii) How does logical and physical independence relate to part (i)? (4 marks)

(b) Discuss entity integrity using a relational database diagram to illustrate your answer. (6 marks)

(c) Identify **FIVE (5)** types of periodic maintenance performed during the maintenance and evolution phase of database life cycle. (5 marks)

(Total: 25 marks)

QUESTION 3

(a) Consider the following Hotel Reservation. Derive the relations in unnormalized form (UNF), and normalize it from UNF to third normal form (3NF). Show all steps taken to normalize the relations and clearly state any assumptions made (if necessary). (10 marks)

PACIFIC HOTEL
RESERVATION PARTICULARS

RESERVATION NO.: TVI/457909 **RESERVATION DATE:** 16 OCTOBER 2022

CUSTOMER NO: CN3470
CUSTOMER NAME: JONNIE EE
CUSTOMER CONTACT: 010-666 3355
CUSTOMER ADDRESS: MT-8, JALAN AYER KEROH, 75450 MELAKA.

ROOM DETAILS:

ROOM NO	ROOM TYPE	ROOM RATE	CHECK-IN	CHECK-OUT	NO. OF GUESTS
325	DELUXE-SINGLE	RM 250	08-DEC-2022	20-DEC-2022	1
679	DELUXE-DOUBLE	RM 300	27-DEC-2022	30-DEC-2022	2

(b) Based on the set of 3NF relations derived in (b), draw a complete entity relationship diagram (ERD) using **Chen notation**. Make sure that all the entities, attributes, relationships and connectivities are included in your ERD. (9 marks)

(c) List **THREE (3)** characteristics of Internet technologies and briefly describe **ONE (1)** benefit for each characteristic that you have identified. (6 marks)

(Total: 25 marks)

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QUESTION 4

Based on the following tables, write appropriate SQL statements to carry out the following tasks:

PET

PET_ID	PET_NAME	QUOTED_PRICE	COMMENT	CLIENT_ID
P001	Mickey	RM 100	Barks a lot, but is harmless.	C1010
P002	Bruno	RM 200	Bruno is afraid of strangers.	C1050
P003	Lulu	RM 150	Loves attention.	C1030

CLIENT

CLIENT_ID	CLIENT_NAME	CLIENT_PHONE	STATE
C1010	Charlie Chan	010-660 4567	Melaka
C1030	Irene Lee	016-324 8906	KL
C1050	Lily Lai	012-789 3475	KL

(a) Create the PET table, using the following table definition: (7 marks)

Field Name	Data Type	Size	Remarks
PET_ID	Short Text	10	Primary key
PET_NAME	Short Text	20	Required
QUOTED_PRICE	Number	-	-
COMMENT	Short Text	200	-
CLIENT_ID	Short Text	10	-

(b) Alter the size of the PET_NAME field from the current 20 characters to 30 characters. (2 marks)

(c) Add the following record into the CLIENT table. (2 marks)

CLIENT_ID	CLIENT_NAME	CLIENT_PHONE	STATE
C1020	Jasper Sim	017-271 8990	PJ

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(d) Update the CLIENT_PHONE of CLIENT_ID: C1010 to 014-660 4500. (3 marks)

(e) Select all the details of clients that are NOT from Melaka. (2 marks)

(f) Display the value of the highest QUOTED_PRICE. (1 mark)

(g) Display the PET_NAME, CLIENT_NAME and CLIENT_PHONE where the QUOTED_PRICE is above RM 100. (4 marks)

(h) List the PET_NAME and QUOTED_PRICE for all pets whose QUOTED_PRICE are below 200. Sort the result so that those with the highest QUOTED_PRICE are listed first. (4 marks)

(Total: 25 marks)

End of Paper.